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EXAMINER	
CHURCH, CRAIG E	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/743,195	HOPKINS ET AL.	
	Examiner	Art Unit	
	Krystyna Suchecki	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-21 and 23-72* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-21 and 23-72* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5-21, 25-48, 51-58 and 61-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krug in view of Zhou (US 2004/0213378).

1. Regarding claims 1, 5, 10, 11, 21, 41, 42, 48, 58, 68 and 72, Krug teaches a system and method for detecting an explosive with an article (Column 10, lines 18-25) comprising:

a. An acquisition subsystem including a computed tomography scanner machine having a stationary radiation source and a stationary detector, said acquisition subsystem is adapted to acquire intensity measurements pertaining to the explosive (Column 13, line 58- Column 14, line 8);

b. A reconstruction subsystem comprising a plurality of reconstruction stages, in communication with the acquisition subsystem, for generating view data from the intensity measurements and for reconstructing the view data into image data representative of the explosive (Column 19, line 20- Column 20, line 42);

c. A computer-aided detection subsystem, comprising a plurality of computer-aided detection stages, for analyzing the image data (Column 16, lines 1-46);

d. At least one additional source of information pertaining to the explosive, wherein the image data and the at least one additional source of information assist in identifying the explosive (Column 23, lines 11-58);

e. An energy discriminating detector for discriminating between high-energy and low-energy signatures (Column 16, lines 1-7);

f. Analyzing the reconstructed data to identify the object (Columns 23 and 24).

2. Krug fails to teach a reconstruction subsystem utilizing three-dimensional reconstruction techniques, or detecting an object within a human body.

3. Zhou teaches improvements to stationary computed tomography systems that allow three dimensional reconstruction once view data is converted into image data representative of an object (Paragraphs 10, 64-67, 70, 71). The stationary nature of the computed tomography system allows for precise control of sources for the development of imaging techniques and for the refinement of acquisition techniques and the three-dimensional nature of the reconstructed image allows for localization of objects (Paragraphs 10 and 65). Zhou also teaches a method for detecting an object within a human body for rapid body imaging of trauma or stroke (Paragraph 76).

4. Therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the three dimensional reconstruction of Zhou in the

system and method of Krug to allow for the development of imaging techniques, the refinement of acquisition techniques and for localization of objects (Zhou, Paragraphs 10 and 65). Krug could also detect an object within a human body, as taught by Zhou, for rapid body imaging of trauma or stroke (Paragraph 76).

5. Regarding Claims 6, 8, 9, 30, 32, 33, 52, 53, 61, 63 and 64, Krug teaches a system and method where a plurality of reconstruction stages comprise one reconstruction stage including an algorithm adapted to reduce artifacts in the image data, one reconstruction stage including an algorithm adapted to compensate for noise in the acquired information and one reconstruction stage including an algorithm adapted to iteratively and statistically reconstruct the image data (Column 16, lines 1-7; Column 21, lines 56-65; and Column 27, lines 9-15).

6. Regarding Claims 7, 31 and 62, Krug teaches a system and method wherein a reconstruction stage includes an algorithm adapted to vary the voxel size in the image data (Column 8, lines 43-50; Column 30, lines 1-43). Since a voxel is a volume of pixels, and Krug re-evaluates pixels across multiple slices dependent upon the explosive object's size, the voxel for evaluation is varied in the image data.

7. Regarding Claims 12-14, 34 and 54, Krug teaches a system and method wherein at least one of the plurality of computer-aided detection stages is in communication with any of the plurality of reconstruction stages and is adapted to receive the image data from one of the reconstruction stages, analyze the image data, and identify an area of interest within the image data, and is adapted to feedback image data of the area of

interest to the reconstruction subsystem so that a reconstructed image can be analyzed to identify an explosive (Column 26, line 19- Column 17, line 15; and Column 29, line 21- Column 30, line 43).

8. Regarding Claims 15-17, 35-37, 43-44, 70 and 71, Krug teaches a system and method wherein the acquisition subsystem comprises an energy discriminating detector adapted to acquire energy sensitive measurements and provide additional information, which includes an assembly of two or more x-ray attenuating materials the signals from which can be processed in either a photon counting or a charge integration mode, or wherein the acquisition subsystem comprises at least one detector for detecting x-rays from at least two different energy spectra (Column 16, lines 25-38 and Column 31, lines 4-10).

9. Regarding claims 18, 19, 38, 39, 45, 46, 56, 57, 65 and 66, Krug teaches a system and method comprising an additional source of information comprising an alternative modality subsystem comprising one or more of the group consisting of a coherent scattering subsystem, and a trace detection subsystem (Column 6, lines 5-16 and Column 7, line 61- Column 8, line 23).

10. Regarding Claims 20, 40, 51 and 67 Krug teaches a system and method comprising a conveyor belt (5) for transporting the article to the acquisition subsystem.

11. Regarding Claims 25-27 and 55, Krug teaches a system and method wherein the acquisition subsystem is adapted to communicate the view data to the reconstruction subsystem, which is adapted to reconstruct the view data into the image data and communicate the image data to the computer-aided detection subsystem so that the

computer aided detection subsystem is adapted to identify an area of interest within the image data and direct the reconstruction subsystem to re-reconstruct the image data for the area of interest (Column 26, lines 5-50 and Column 29, line 30- Column 30, line 43).

12. Regarding Claims 28 and 29, Krug teaches a system and method wherein an acquisition subsystem is adapted to communicate the view data to the computer-aided detection subsystem, which is adapted to identify an area of interest within the view data and direct the reconstruction subsystem to reconstruct the view data into image data for the area of interest (Column 26, lines 5-50 and Column 29, line 30- Column 30, line 43).

13. Regarding Claim 47, Krug teaches a system and method wherein at least one additional source of information comprises a risk variable subsystem (Column 23).

14. Regarding Claim 69, Krug teaches a method wherein the discriminating step comprises distinguishing between absorption coefficients originating from photoelectric and Compton scatter processes (Column 22, lines 10-20).

15. Claims 3, 4, 23, 24, 49, 50, 59 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krug and Zhou and further in view of Annis (US 6,628,745).

16. Regarding Claims 3, 4, 23, 24, 49, 50, 59 and 60, Krug and Zhou teach the use of a computed tomography system and method as above.

17. Krug fails to teach the use of a computed tomography machine comprising a vacuum housing chamber for generating an electron beam; a target for receiving the electron beam and emitting x-rays in response to the electron beam; a detector array

located opposite the target for receiving the emitted x-rays; a source ring including a plurality of stationary x-ray sources; and a detector ring adjacent to the source ring and including a plurality of discrete detector modules.

18. Annis teaches several configurations of a computed tomography machine for scanning such things as luggage and humans, which are either scanned by the source, or scanned as a result of a conveyor moving the objects past the source and detector (Figures 4, 8 and 19). The configurations are made to replace systems where a single source creates a signal on a single line of detectors (Column 1). The configurations include a vacuum housing chamber (103, 303) which generates an electron beam; a target (105) for receiving the electron beam and emitting x-rays in response to the electron beam; a detector array (108, 312) located opposite the target for receiving the emitted x-rays; a source ring including a plurality of stationary x-ray sources (302-309); and a detector ring (312) adjacent to the source ring and including a plurality of discrete detector modules. The configuration allows for protection of the electron beam source via the vacuum chamber (Columns 4 and 5) and allows for a source and detector ring to cooperate to replace blurred, single slice, single source and detector plane systems so that multiple slices of an object can be obtained for imaging (Column 1).

19. Therefor, it would have been obvious to one of ordinary skill at the time the invention were made to use the multi-source and multi- detector system of Annis in the system of Krug in order to obtain vacuum protection of an electron beam source (Annis, Columns 4 and 5) that can replace blurred, single slice, single source and detector plane systems so that multiple slices of an object can be obtained for imaging (Annis,

Column 1). By duplicating the source and detector ring system for each of the high and low-energy source and detectors, Krug can benefit from the low-blur arrangement in both the high and low energy images.

Response to Arguments

Applicant's arguments with respect to claims 1, 3-21 and 23-72 have been considered but are moot in view of the new ground(s) of rejection. Though applicant contends that no reconstruction is taught by Krug, Examiner has relied upon Krug again for teaching the collection of detected data, its transportation and manipulation within a system and its ultimate construction into an image, i.e. reconstruction. It appears that applicant wishes to rely upon a particular definition of reconstruction which does not appear in the claims, however, since Krug reconstructs collected data into an image as claimed above, Applicant's arguments are not persuasive.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. McCroskey (US 5,023,895) is of interest for teaching three dimensional reconstruction of data collected by a stationary CT system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (571) 272-2495. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAVID V. BRUCE
PRIMARY EXAMINER

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